

Development of a Bridge Inspection and Management Project

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Summary

A research project is undertaken for the combined inspection and management of a pilot group of road bridges in Turkey based on the development of a bridge management system (BMS) for the General Directorate of Highways. The pilot study consists of visual inspections of 200 bridges and detailed inspections of 10 bridges. Visual inspections are planned to be carried out by photogrammetric techniques while detailed inspections will include techniques such as strength determination using probe test systems, ultrasonic testing, reinforcement corrosion detection and measurement. Details of the project are presented herein including budgetary and time schedules. Activities to be completed are presented. The developed system will enable monitoring the safety and maintenance costs of the bridges. The project is conducted by the Department of Engineering Sciences in the Middle East Technical University with the support of a software development firm.

Keywords: bridges, management, inspection, maintenance, testing, software.

1. Introduction

A research project is undertaken for the combined inspection and management of a pilot group of road bridges in Turkey. The pilot study consists of visual inspections of 200 bridges located along the roads at northwest region of the country and detailed inspections of 10 bridges that will be selected among those exhibiting considerable deterioration. Visual inspections are planned to be carried out by photogrammetric techniques (virtual reality) while detailed inspections will include techniques such as strength determination using probe test systems, ultrasonic testing, reinforcement corrosion detection and measurement. Inspection data will be transferred to a web-based bridge management system (BMS) which will be developed as part of the research project. The project is planned to last for 2.5 years and the results will be used to initiate an inspection and management program for the remaining 5860 (as of January 2009) highway and provincial road bridges in the country. Details of the project are presented herein including budgetary and time schedules. Activities to be completed are presented within the context of the project time schedule. Activities include; personnel employment, technical and safety training of the personnel, procurement, software and database development, development and integration of an optimization algorithm for maintenance repair and replacement activities, development of the inspection program, field-to-database data transfer, and final testing and implementation program. The project intends to develop a Bridge Management System that will be continually used by the General Directorate of Highways. The developed system will enable the General Directorate to monitor the safety and maintenance costs of the bridges it owns and to be able to provide justifications to higher authorities for budget requests. The project will be implemented under the leadership of an academic group at the Middle East Technical University with the support of a software development firm.

2. Software and Inspection System Development

The project is divided into four workpackages as shown in Fig.1. The workpackages are 1-Software